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ABSTRACT

In the surface structure of Chinese nominal modifiers (quantifiers, determiners, adjectives, measure phrase, relative clause, etc.) may occur either before or after a modified noun. In most of the transformational studies of Chinese syntax (e.g. Cheng 1966; Hashimotc 1966; Mei 1972; Tai 1973; Teng 1974), it has been assumed that such NP's have the underlying order of modifier + noun (M-N, henceforth) with the variant surface order of noun + modifier (N-M, henceforth) being derived. This paper, however, first argues that Chinese has the underlying order of N-M and that the variant M-N order is due to an optional transformation that reorders the N-M sequence. It is shown that the M-N hypothesis requires a set of complex constraints on the rule postposing modifiers in order to account for various surface patterns exhibited by NP's containing more than one modifier. It will be argued that in the N-M hypothesis proposed here various surface patterns can best be accounted for by constraining the N-M inversion rule to the following effect; namely, it can apply to any NP, either a higher one or a lower one, but only once within the domain of a possible complex NP. (Author)

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NOMINAL MODIFIERS IN MANDARIN CHINESE*

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0. Introduction

In the surface structure of Chinese nominal modifiers (quantifiers, determiners, adjectives, measure phrase, relative clause, etc.) may occur either before or after a modified noun. In most of the transformational studies of Chinese syntax (e.g. Cheng 1966; Hashimoto 1966; Mei 1972; Tai 1973; Teng 1974), it has been assumed that such NP's have the underlying order of modifier + noun (M-N, henceforth) with the variant surface order of noun + modifier (N-M, henceforth) being derived.

This paper, however, first argues that Chinese has the N-M order underlyingly, and that the variant M-N order is due to an optional transformation that reorders the N-M sequence. It is shown that the M-N hypothesis requires a set of complex constraints on the rule postposing modifiers in order to account for various surface patterns exhibited by NP's containing more than one modifier. It will be argued that in the N-M hypothesis proposed here various surface patterns can best be accounted for by constraining the N-M inversion rule to the following effect; namely, it can apply to any NP, either a higher one or a lower one, but only once within the domain of a possible complex NP.

Nominal modifiers in Chinese may also occur either before or after a verb. As opposed to the recent proposal in which such modifiers are to be analyzed as part of the VP (e.g. Li and Thompson 1974; Tai 1973; Teng 1974), this paper also provides and motivates a transformation proposed here as modifier postposing. It is shown that the recent proposal is inadequate because it provides no syntactic and semantic evidence in support of such a hypothesis. It will be argued that such modifiers can be best derived by undergoing a rule of modifier postposing, moving a modifier from a prenominal position to a postverbal position.

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1. Nominal Modifiers and Noun Phrases

1.1. M-N Hypothesis vs M-N Hypothesis

In Chinese nominal modifiers (determiners, quantifiers, adjectives, relative clauses, etc.) can occur either before or after a modified noun. This is exemplified in the following sets of sentences.

A. Quantifiers

(1) a. Qiúanbù xiuéshēng láile. 'All of the students came.'
all student came

b. Xiuéshēng qiúanbù láile.
student all came

(2) a. Měiyígè xiuéshēng láile. 'Each of the students came.'
each student came

b. Xiuéshēng měiyígè láile.
student each came

(3) a. Móxiē xiuéshēng láile. 'Some students came.'
some student came

b. Xiuéshēng móxiē láile.
student some came

(4) a. Hěnduō xiuéshēng láile. 'Many students came.'
many student came

b. Xiuéshēng hěnduō láile.
student many came

(5) a. Yìbǎigì xiuéshēng láile. 'One hundred students came.'
100 student came

b. Xiuéshēng yìbǎigè láile.
student 100 came

B. Determiners

(6) a. Nèixiē xiuéshēng láile. 'Those students came.'
those student came

b. Xiuéshēng nèixiē láile.
student those came

C. Adjective

(7) a. Tsūngmíngde xiuéshēng láile. 'The intelligent students came.'
intelligent student came

b. Xiuéshēng tsūngmíngde láile.
student intelligent came

D. Measure Phrase

(8) a. Èrshísuèidàde xiuéshēng láile. 'The twenty-year-old students
20-year-old student came came.'

b. Xiuéshēng èrshísuèidàde láile.
student 20-year-old came

E. Relative Clause

(9) a. Dài yǐanjìng de xiuéshēng láile. 'The students who wear
wear glasses rel. student came glasses came.'

b. Xiuéshēng dài yǐanjìng de láile.
student wear glasses rel. came

There are in general two ways in which sentences (1)-(9) may be analyzed. One way is to claim that nominal modifiers such as quantifiers, determiners, adjectives, measure phrases, and relative clausese in prenominal positions as shown in (1a)-(9a) are underlying forms, and those in postnominal positions as shown in sentences (1b)-(9b) are derived forms. Within this type of analysis, on the one hand, in order to generate sentences (1a)-(9a), a phrase structure rule such as follows is needed.

(10) NP $\longrightarrow$ (M) + N

where M = quantifiers,
determiners,
adjectives,
measure phrase,
relative clause, etc.

On the other hand, to derive sentences (1b)-(9b) from (1a)-(9a) respectively, an optional transformation that moves nominal modifier to a postnominal position is also needed. The proposed M-N inversion transformation can be schematized as shown in (11).

$$NP\left[\ M_{\underline{1}}\quad N_{\underline{2}}\ \right]_{NP} \Longrightarrow 2\quad 1$$

where M = quantifiers,
determiners,
adjectives,
measure phrase,
relative clause, etc.

The other possibility is that we can claim that nominal modifiers in postnominal positions as shown in (1b)-(9b) are underlying forms, and those in prenominal positions as shown in (1a)-(9a) are derived forms. Within this type of analysis, on the one hand, in order to generate sentences (1b)-(9b), a phrase structure rule such as follows is needed:

(12)

$$NP \longrightarrow N + (M)$$

where M = quantifiers,
determiners
adjectives,
measure phrase,
relative clause, etc.

To derive sentences (1a)-(9a) from (1b)-(9b) respectively, on the other hand, a transformation that moves modfiers to a prenominal position such as (13) is needed.

(13) N-M Inversion: $$NP\left[\ N_{\underline{1}}\quad M_{\underline{2}}\ \right]_{NP} \Longrightarrow 2\quad 1$$

In the case of sentences containing one modifier such as (1a)-(9a), these two analyses seem to b equally adequate, since both make correct predictions about surface forms of modified NP in Chinese. Below I would like to show how the proposed hypothesis that Chinese NP has N-M as the underlying order, with M-N being derived, is preferable to the one that it has M-N as the underlying order with N-M being derived. The proposed analysis is superior because it does not need a set of complex constraints on the rule postposing modifiers in accounting for various surface patterns exhibited by NP's containing more than one modifier.

1.2. Noun Phrases Containing Two Modifiers

This section provides a discussion on how the above two analyses can handle cases where NP's containing two nominal modifiers. For the sake of discussion, let us consider the following sets of sentences:

A. Quantifiers and Determiners

(14) a. Qiúanbù xiuéshēng nèixiē láile. 'All of those students came.'
all student those came

b. Nèixiē xiuéshēng qiúanbù láile.
those student all came

c. Xiuéshēng nèixiē qiúanbù láile.
student those all came

d.* Qiúanbù nèixiē xiuéshēng láile.
all those student came

(15) a. Méiyígè xiuéshēng nèixiē láile. 'Each of those students came.'
each student those came

b. Nèixiē xuéshēng měiyígè láile.
those student each came

c. Xuéshēng nèixiē měiyígè láile.
student those each came

d. *Měiyígè nèixiē xuéshēng láile.
each those student came

(16) a. Mǒxiē xuéshēng nèixiē láile. 'Some of those students came.'
some student those came

b. Nèixiē xuéshēng mǒxiē láile.
those student some came

c. Xuéshēng nèixiē mǒxiē láile.
student those some came

d. *Mǒxiē nèixiē xuéshēng láile.
some those student came

(17) a. Hěnduō xuéshēng nèixiē láile. 'Many of those students came.'
many student those came

b. Nèixiē xuéshēng hěnduō láile.
those student many came

c. Xuéshēng nèixiē hěnduō láile.
student those many came

d. *Hěnduō nèixiē xuéshēng láile.
many those student came

(18) a. Yìbǎigè xuéshēng nèixiē láile. 'One hundred of those students came.'
100 student those came

b. Nèixiē xuéshēng yìbǎigè láile.
those student 100 came

c. Xuéshēng nèixiē yìbǎigè láile.
student those 100 came

d. *Yìbǎigè nèixiē xuéshēng láile.
100 those student came

B. Quantifiers and Adjectives

(19) a. Qiúanbù xuéshēng tsūngmíngde láile. 'All of the intelligent students came.'
all student intelligent came

b. Tsūngmíngde xuéshēng qiúanbù láile.
intelligent student all came

c. Xuéshēng tsūngmíngde qiúanbù láile.
student intelligent all came

d. *Qiúanbù tsūngmíngde xuéshēng láile.
all intelligent student came

(20) a. Měiyígè xuéshēng tsūngmíngde láile. 'Each of the intelligent
each student intelligent came students came.'

b. Tsūngmíngde xuéshēng měiyígè láile.
intelligent student each came

c. Xuéshēng tsūngmíngde měiyígè láile.
student intelligent each came

d. *Měiyígè tsūngmíngde xuéshēng láile.
each intelligent student came

(21) a. Mǒxie xuéshēng tsūngmíngde láile. 'Some of the intelligent
some student intelligent came

b. Tsūngmíngde xuéshēng mǒxie láile.
intelligent student some came

c. Xuéshēng tsūngmíngde mǒxie láile.
student intelligent some came

d. *Mǒxie tsūngmíngde xuéshēng láile.
some intelligent student came

(22) a. Hěnduō xuéshēng tsūngmíngde láile. 'Many of the intelligent
many student intelligent came

b. Tsūngmíngde xuéshēng hěnduō láile.
intelligent student many came

c. Xuéshēng tsūngmíngde hěnduō láile.
student intelligent many came

d. *Hěnduō tsūngmíngde xuéshēng láile.
many intelligent student came

(23) a. Yìbǎigè xuéshēng tsūngmíngde láile. 'One hundred of the intelligent
100 student intelligent came students came.'

b. Tsūngmíngde xuéshēng yìbǎigè láile.
intelligent student 100 came

c. Xuéshēng tsūngmíngde yìbǎigè láile.
student intelligent 100 came

d. *Yìbǎigè tsūngmíngde xuéshēng láile.
100 intelligent student came

C. Quantifiers and Relative Clauses

(24) a. Qiúanbù xiuéshēng dài yǐanjìng de láile.
all student wear glasses rel. came
'All of the students who wear glasses came.'

b. Dài yǐanjìng de xiuéshēng qiúanbù láile.
wear glasses rel. student all came

c. Xiuésheng dài yǐanjìng de qiúanbù láile.
student wear glasses rel. all came

d. *Qiúanbù dài yianjing de xiuéshēng láile.
all wear glasses rel. student came

(25) a. Méiyígè xiuéshēng dài yǐanjìng de láile.
each student wear glasses rel. came
'Each of the students who wear glasses came.'

b. Dài yǐanjìng de xiuéshēng méiyígè láile.
wear glasses rel. student each came

c. Xiuéshēng dài yǐanjìng de méiyígè láile.
student wear glasses rel. each came

d. *Méiyígè dài yǐanjìng de xiuéshēng láile.
each wear glasses rel. student came

(26) a. Mǒxiē xiuéshēng dài yǐanjìng de láile.
some student wear glasses rel. came
'Some of the students who wear glasses came.'

b. Dài yǐanjìng de xiuéshēng mǒxiē láile.
wear glasses rel. student some came

c. Xiuéshēng dài yǐanjìng de mǒxiē láile.
student wear glasses rel. some came

d. *Mǒxiē dài yǐanjìng de xiuéshēng láile.
some wear glasses rel. student came

(27) a. Hěnduō xiuéshēng dài yǐanjìng de láile.
many student wear glasses rel. came
'Many of the students who wear glasses came.'

b. Dài yǐanjìng de xiuéshēng hěnduō láile.
wear glasses rel. student many came

c. Xiuéshēng dài yǐanjìng de hěnduō láile.
student wear glasses rel. many came

d. *Hěnduō dài yǐanjìng de xiuéshēng láile.
many wear glasses rel. student came

(28) a. Yìbǎigè xiuéshēng dài yǐanjìng de láile.
100 student wear glasses rel. came
'One hundred of the students who wear glasses came.'

b. Dài yǐanjìng de xiuéshēng yìbǎigè láile.
wear glasses rel. student 100 came

c. Xuéshēng dài yǐanjìng de yìbǎige láile.
student wear glasses rel. 100 came

d. *Yìbǎige dài yǐanjìng de xuéshēng láile.
100 wear glasses rel. student came

D. Quantifiers and Measure Phrases

(29) a. Qúanbù xuéshēng èrshísuìdade láile. 'All of the 20-year-old students came.'
all student 20-year-old

b. Èrshísuìdade xuéshēng qúanbù láile.
20-year-old student all came

c. Xuéshēng èrshísuìdade qúanbù láile.
student 20-year-old all came

d. *Qúanbù èrshísuìdade xuéshēng láile.
all 20-year-old student came

(30) a. Měiyíge xuéshèng èrshísuìdade láile. 'Each of the 20-year-old students came.'
each student 20-year-old came

b. Èrshísuìdade xuéshēng měiyíge láile.
20-year-old student each came

c. Xuéshēng èrshísuìdade měiyíge láile.
student 20-year-old each came

d. *Měiyíge èrshísuìdade xuéshēng láile.
each 20-year-old student came

(31) a. Mǒxie xuéshēng èrshísuìdade láile. 'Some of the 20-year-old students came.'
some student 20-year-old came

b. Èrshísuìdade xuéshēng mǒxie láile.
20-year-old student some came

c. Xuéshēng èrshísuìdade mǒxie láile.
student 20-year-old some came

d. *Mǒxie èrshísuìdade xuéshēng láile.
some 20-year-old student came

(32) a. Hěnduō xuéshēng èrshísuìdade láile. 'Many of the 20-year-old students came.'
many student 20-year-old came

b. Èrshísuìdade xuéshēng hěnduō láile.
20-year-old student many came

c. Xuéshēng èrshísuìdade hěnduō láile.
student 20-year-old many came

d. *Hěnduō èrshísuìdade xuéshēng láile.
many 20-year-old student came

(33) a. Yìbǎigè xuéshēng èrshísuìdàde láile. 'One hundred of the 20-
100 student 20-year-old came year-old students came.'

b. Èrshíshìdàde xuéshēng yìbǎigè láile.
20-year-old student 100 came

c. Xuéshēng èrshísuìdàde yìbǎigè láile.
student 20-year-old 100 came

d. *Yìbǎigē èrshísuìdàde xuéshēng láile.
100 20-year-old student came

A close examination of sentences (14)-(33) shows that the acceptable and unacceptable sentences fall into the following patterns:

(34) a. $[\ M_1[\ N\ M_2\ ]_{NP_2}\ ]_{NP_1}$ e.g. (14a) - (33a)

b. $[\ [\ M_2\ N\ ]_{NP_2}\ M_1\ ]_{NP_1}$ (14b) - (33b)

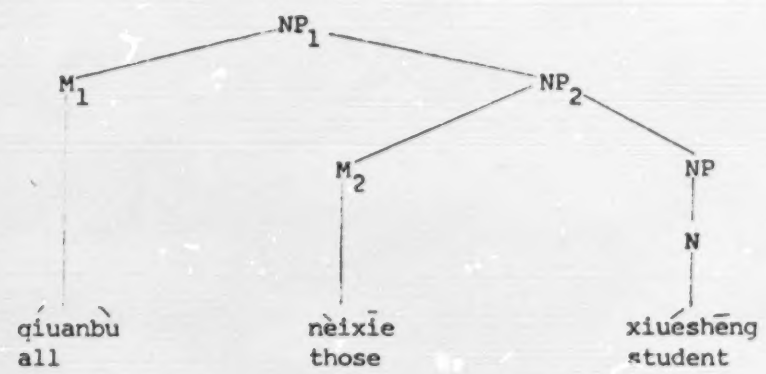
c. $[\ [\ N\ M_2\ ]_{NP_2}\ M_1\ ]_{NP_1}$ (14c) - (33c)

d. *$[\ M_1[\ M_2\ N\ ]_{NP_2}\ ]_{NP_1}$ (14d) - (33d)

1.2.1. M-N Hypothesis

Let us first see how the M-N hypothesis can account for the above patterns. Taking the position that the underlying order for Chinese NP is M-N, with N-M being derived by the M-N inversion transformation, then the modified NP in (14), for example, will have the following underlying structure:

(35)



Given a structure like (35), in order to derive (14a, b, c)-(33a, b, c), but to block (14d)-(33d), a set of complex constraints on the rule of M-N inversion are needed. First, in order to yield the form $[_{NP_1}\ M_1\ [_{NP_2}\ N\ M_2\ ]_{NP_2}\ ]_{NP_1}$ (e.g. (14a)-(33a)), it is necessary to constrain the rule of M-N inversion so that only the lower NP (NP_2) can be affected. Second, in order to yield the form $[_{NP_1}\ [_{NP_2}\ M_2\ N\ ]_{NP_2}\ M_1\ ]_{NP_1}$ (e.g. (14b)-(33b)), it is necessary to constrain the rule so that only the higher NP (NP_1) can be affected. Third, to yield the form $[_{NP_1}\ [_{NP_2}\ N\ M_2\ ]_{NP_2}\ M_1\ ]_{NP_1}$ (e.g. (14c)-(33c)) but to block $*[_{NP_1}\ M_1\ [_{NP_2}\ M_2\ N\ ]_{NP_2}\ ]_{NP_1}$ (e.g. (14d)-(33d)) it is necessary to constrain the rule so that both the higher and lower NP's (NP_1 and NP_2) can be affected. The first constraint, according to which only the lower NP can be affected by the rule, suggests that the M-N inversion in Chinese is an 'upward bound' rule (Ross 1967:146). However, such a proposal is not valid because it contradicts the second constraint, according to which only the higher NP can be affected by the rule. In other words, the second constraint suggests that the M-N inversion obeys the 'A-over-A' principle (Chomsky 1973:235). According to this principle, the rule of M-N inversion would allow only the maximum NP to be chosen to account for cases such as (14b)-(33b). Again, this proposal is not valid either because if the rule of M-N inversion in Chinese were to obey the 'A-over-A' principle, then it would fail to explain cases such as (14a)-(33a) where the lower NPs are affected by the rule. The third constraint, according to which both higher and lower NPs (NP_1 and NP_2) can be affected by the rule, suggests that the proposed M-N inversion obligatorily applies to every representation that satisfies its structural description. However, such a proposal is not valid either because it does not hold for cases like (14a, b)-(33a, b), according to which only one of the NP's can be affected by the rule.

The major difficulty in this analysis is the problem of how the rule of M-N inversion can be adequately constrained so that only the well-formed sentences can be generated. A close examination of (34) demonstrated that there is a significant relationship between the well-formedness of sentences and the selection of the NP's to which the rule of M-N inversion can apply. On the other hand, a sentence is will-formed if either one or both NP's is affected by the rule. On the other hand, a sentence is ill-formed if none of the NP's is affected by the rule. This clearly suggests that the rule of M-N inversion cannot be interpreted as an optional rule to account for sentences whose NP's containing two modifiers such as (14)-(33). Rather, it must be obligatory in one case, and it must be optional in the other. In other words, to account for cases (14c)-(33c) but to block (14d)-(33d), the rule of M-N inversion applies to all the NP's (NP_1 and NP_2) that satisfies its structural description. On the contrary, to account for cases such as (14a, b)- (33a, b), the same rule obligatorily applies to one of the NP's leaving the other NP unaffected. This means that after the rule of M-N inversion has operated on one of the NP's, the same rule is optionally applied to the other. For example, in order to derive (14a) from (35) we can make the rule of M-N inversion obligatorily apply to NP_2 but leaving NP_1 unaffected by saying that after the rule has applied to NP_2 the same rule is optionally applied to NP_1. To sum up, in order to account for the well-formedness on cases like (14)-(33), the proposed M-N inversion rule as in (11) must be somehow reformulated in the following fashion:

(36) $$\underset{1}{X} \quad \underset{2}{Y} \quad \underset{3}{M} \quad \underset{4}{Z} \quad \underset{5}{N} \rceil_{NP} \quad \underset{6}{W} \Longrightarrow 1 \quad 2 \quad \emptyset \quad 4 \quad 5+3 \quad 6$$

Conditions: (i) obligatory if 2 or 4 contains M
(ii) optional otherwise
(iii) W does not contain an NP

M = quantifiers, determiners, adjectives, measure phrase, relative clause, etc.

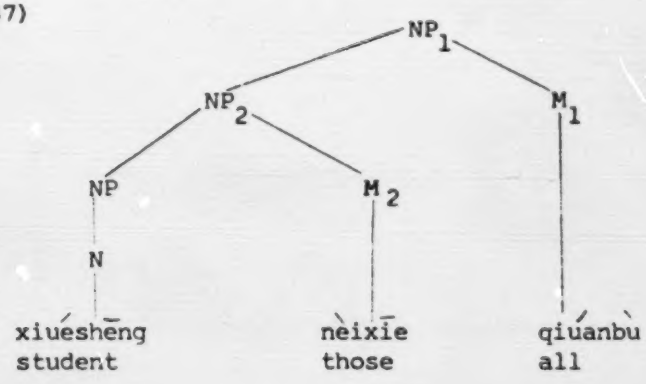
The problem in (36) is that the constraints on the rule of M-N inversion is so complex that it would greatly complicate the grammar. Another factor argues against the M-N hypothesis is that starting out with a sequence such as $[_{M_1}\ [_{M_2}\ N\ ]_{NP}]$ in the underlying structure is syntactically unmotivated since a structure as such never occurs in the surface.

It has been argued in this section that Chinese sentences whose NP's containing two modifiers cannot be explained with an M-N sequence underlyingly unless certain highly complex constraints are implemented into the grammar. Below I will argue that various sruface patterns can be nicely accounted for with an N-M sequence without positing complex constraints on the rule.

1.2.2. N-M Hypothesis

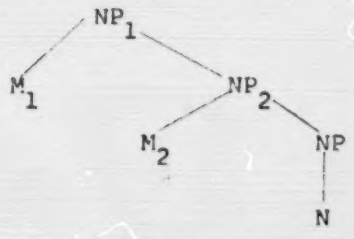
Starting out with a N-M sequence as the underlying order, the modified NP in (14) will have the following underlying structure:

(37)

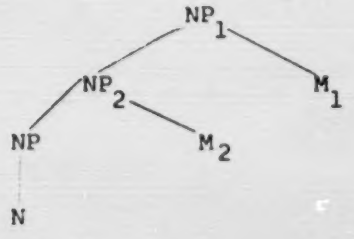


Three facts should be noticed here. First, a structure like (37) is a mirror image of (35). Consider:

(38) a.



b.



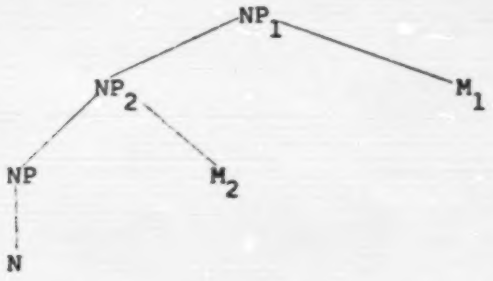
Second, the selection of the NP's to which the rule inversing modifiers and nouns of these two structures are in complementary distribution. For example, to derive (14a) within the M-N hypothesis, it is necessary to apply the rule of M-N inversion to NP_2 but not to NP_1, whereas in this analysis the rule of N-M inversion must affect NP_1 but not NP_2. To obtain (14b) within the M-N hypothesis, it is necessary to apply the rule of M-N inversion to NP_1 but not to NP_2, whereas in this analysis it is necessary to apply the rule of N-M inversion to NP_2 but not to NP_1. To obtain (14c) within the M-N hypothesis, it is necessary to apply the rule of M-N inversion to both NP_1 and NP_2, whereas in this analysis none of the NP's is affected by the rule of N-M inversion. Third, the acceptability of (14a, b)- (33a, b) and the unacceptability of (14d)-(33d) are related to the selection of the NP's to be affected by the rule of N-M inversion; namely a sentence is well-formed if only one NP is affected by the rule within the domain of a complex NP. Otherwise a sentence is ill-formed. Consider the following table:

(39)

surface form	sentence	NP's are affected by the N-M inversion	well-formedness
$[_{M_1}[_{N}\ M_2\ ]_{NP_2}\ ]_{NP_1}$	(14a-33a)	NP_1	well-formed
$[[_{M_2}\ N\ ]_{NP_2}\ M_1\ ]_{NP_1}$	(14b-33b)	NP_2	well-formed
$[[_{N}\ M_2\ ]_{NP_2}\ M_1\ ]_{NP_1}$	(14c-33c)	Ø (generated by phrase structure rules in the base)	well-formed
$*[_{M_1}[_{M_2}\ N\ ]_{NP_2}\ ]_{NP_1}$	(14d-33d)	NP_1, NP_2	ill-formed

The above demonstrates that we can account for the well-formedness of (14a, b, c, d)-(33a, b, c, d) by constraining the rule of N-M inversion in such a way it can apply to any NP, either a higher one or a lower one, but only once within the domain of a possible complex NP.[1] In other words, in the following underlying structure:

(40)



The rule of N-M inversion can apply to either NP_1 or NP_2, but only one of them can be affected. For example, if NP_1 is chosen, then NP_2 cannot be chosen; and if NP_2 is chosen, then NP_1 cannot be chosen. The proposed constraint on the rule of N-M inversion can be summarized as follows:

(41) N-M inversion can apply to any NP that satisfies its structural description but only once within the domain of a possible complex NP.

Comparing this analysis based on our N-M hypothesis with the one based on the M-N hypothesis, we conclude that the former is more desirable than the latter because it provides a nice account of various surface patterns without positing highly complex constraints on the rule.

1.3. NP's Containing Three Modifiers

Another set of sentences that provide support for the proposed N-M hypothesis is to be found in the following:

(42)a. Qiúanbù xiuéshēng nèixiē dài yǐanjìng de láile. 'All of those
all student those wear glasses rel. came students who wear glasses came.'

b. Dài yǐanjìng de xiuéshēng nèixiē qiúanbù láile.
wear glasses rel. student those all came

c. Nèixiē xiuéshēng dài yǐanjìng de qiúanbù láile.
those student wear glasses rel. all came

d. Xiuéshēng nèixiē dài yǐanjìng de qiúanbù láile.
student those wear glasses rel. all came

e. *Dài yǐanjìng de nèixiē xiuéshēng qiúanbù láile.
wear glasses rel. those student all came

f. *Qiúanbù nèixiē xiuéshēng dai yǐanjìng de láile.
all those student wear glasses rel. came

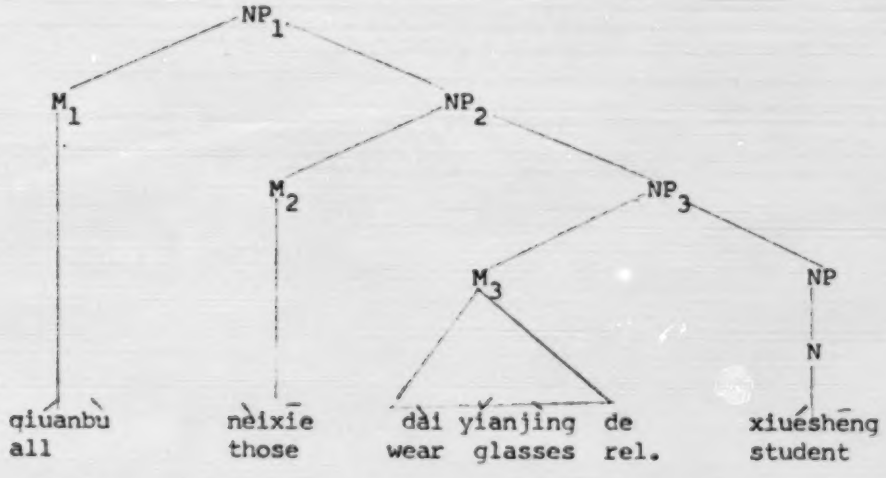
g. *Qiúanbu dai yǐanjìng de xiuéshēng nèixiē láile.
all wear glasses rel. student those came

h. *Qiúanbù dai yǐanjìng de nèixiē xiuéshēng láile.
all wear glasses rel. those student came

1.3.1. M-N Hypothesis

Let us first take a look at how the proposed M-N hypothesis can handle sentences above. Starting out with a M-N sequence underlyingly, NP in (42) will have the following underlying structure:

(43)



For the sake of convenience, consider the patterns as exhibited in (42):

(44)a. $[[M_1 \; N \; M_3]_{NP_3} \; M_2]_{NP_2}]_{NP_1}$ e.g. (42a)

b. $[[M_2 \; N \; M_3]_{NP_3}]_{NP_2} \; M_1]_{NP_1}$ (42b)

c. $[[[M_3 \; N]_{NP_3} \; M_2]_{NP_2} \; M_1]_{NP_1}$ (42c)

d. $[[[N \; M_3]_{NP_3} \; M_2]_{NP_2} \; M_1]_{NP_1}$ (42d)

e. $*[[M_2 \; M_3 \; N]_{NP_3}]_{NP_2} \; M_1]_{NP_1}$ (42e)

f. $*[[M_1 \; M_3 \; N]_{NP_3} \; M_2]_{NP_2}]_{NP_1}$ (42f)

g. $*[M_1 \; [M_2 \; N \; M_3]_{NP_3}]_{NP_2}]_{NP_1}$ (42g)

h. $*[M_1 \; [M_2 \; M_3 \; N]_{NP_3}]_{NP_2}]_{NP_1}$ (42h)

and the table indicating the relationships between the well-formedness of the sentences and the selection of the NP's to which the rule of M-N inversion can apply.

(45)

surface form	sentence	NP's are affected by the M-N inversion rule	NP's are not affected by the M-N inversion rule	well-formedness
$[[M_1 \; N \; M_3]_{NP_3} \; M_2]_{NP_2}]_{NP_1}$	e.g.(42a)	NP_2, NP_3	NP_1	well-formed
$[[M_2 \; N \; M_3]_{NP_3}]_{NP_2} \; M_1]_{NP_1}$	(42b)	NP_1, NP_3	NP_2	well-formed
$[[[M_3 \; N]_{NP_3} \; M_2]_{NP_2} \; M_1]_{NP_1}$	(42c)	NP_1, NP_2	NP_3	well-formed
$[[[N \; M_3]_{NP_3} \; M_2]_{NP_2} \; M_1]_{NP_1}$	(42d)	NP_1, NP_2, NP_3	$\emptyset$	well-formed
$*[[M_2 \; M_3 \; N]_{NP_3}]_{NP_2} \; M_1]_{NP_1}$	(42e)	NP_1	NP_2, NP_3	ill-formed
$*[[M_1 \; M_3 \; N]_{NP_3} \; M_2]_{NP_2}]_{NP_1}$	(42f)	NP_2	NP_1, NP_3	ill-formed

• $[_{M_1}[_{M_2}[_{N}\ M_3]_{NP_3}]_{NP_2}]_{NP_1}$	(42g)	NP_3	NP_1, NP_2	ill-formed
• $[_{M_1}[_{M_2}[_{M_3}\ N]_{NP_3}]_{NP_2}]_{NP_1}$	(42h)	(generated by phrase structure rules in the base)	Ø	ill-formed

The above table demonstrate that in order to derive well-formed sentences (e.g. 42 a, b, c, d), but to block ill-formed ones (e.g. 42 e, f, g, h), a number of complex constraints on the rule of M-N inversions are needed. First, to derive the form $[[[N\ M_3]_{NP_3}\ M_2]_{NP_2}\ M_1]_{NP_1}$ (e.g. 42d) but to block the form • $[_{M_1}[_{M_2}[_{M_3}\ N]_{NP_3}]_{NP_2}]_{NP_1}$ (e.g. 42h) it is necessary to constrain the rule of M-N inversion so that it must apply to every NP, moving M_1, M_2, and M_3 to a postnominal position. Second, to obtain the form $[[M_1[_{N}\ M_3]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$ (e.g. 42a), $[[M_2[_{N}\ M_3]_{NP_3}]_{NP_2}\ M_1]_{NP_1}$ (e.g. 42b), $[[[M_3\ N]_{NP_3}\ M_2]_{NP_2}\ M_1]_{NP_1}$ (e.g. 42c), but to block the forms • $[[M_2[_{M_3}\ N]_{NP_3}]_{NP_2}\ M_1]_{NP_1}$ (e.g. 42e), • $[[M_1[_{M_3}\ N]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$ (e.g. 42f), and • $[_{M_1}[_{M_2}[_{N}\ M_3]_{NP_3}]_{NP_2}]_{NP_1}$ (e.g. 42g), it is necessary to constrain the rule so that it must apply to every NP that satisfies its structural description but at least one of those NP's must not be affected by the rule.

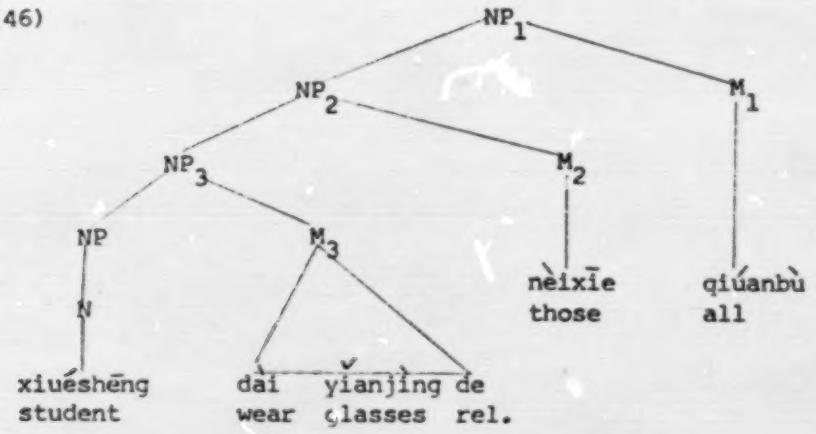
The above demonstrates not only that our analysis based on the M-N hypothesis is not desirable because of the complication involved with the derivation, but also that, if sentences like (42a-42d) are assumed to have an underlying structure like (43), then the only way to derive these sentences but to block (42e-42h), is to implement a set of complex constraints as in (36) on the rule of M-N inversion, thereby complicating the grammar. For example,

to derive (42a), the rule of M-N inversion obligatorily applies to NP_2 and NP_3 but optionally to NP_1. On the other hand, to derive (42d), the same rule obligatorily applies to NP_1, NP_2, and NP_3. Constraints as such, as I have argued earlier, is not desirable because it would greatly complicate the grammar.

1.3.2. N-M Hypothesis

Following the N-M hypothesis proposed earlier, starting out with a N-M sequence the modified NP in (42) will have the following underlying structure:

(46)



It is relatively easy to show that previously proposed constraint as in (41) on the rule of N-M inversion holds here. In order to demonstrate that we have to show that the significant relationship between the well-formedness of sentences of (42) and the selection of the NP's to which the rule of N-M inversion can apply hold cases like (42). Consider the following table:

(47)

surface form	sentence	NP's are affected by the N-M inversion rule	NP's are not affected by the N-M inversion rule	well-formedness
$[[M_1[N\ M_3]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$	e.g. (42a)	NP_1	NP_2, NP_3	well-formed
$[[M_2[N\ M_3]_{NP_3}]_{NP_2}\ M_1]_{NP_1}$	(42b)	NP_2	NP_1, NP_3	well-formed

$[[[M_3\ N]_{NP_3}\ M_2]_{NP_2}\ M_1]_{NP_1}$	(42c)	NP_3	NP_1, NP_2	well-formed
$[[[N\ M_3]_{NP_3}\ M_2]_{NP_2}\ M_1]_{NP_1}$	(42d)	∅	(generated by phrase structure rules in the base)	well-formed
$*[[M_2[M_3\ N]_{NP_3}]_{NP_2}\ M_1]_{NP_1}$	(42e)	NP_2, NP_3	NP_1	ill-formed
$*[[M_1[M_3\ N]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$	(42f)	NP_1, NP_3	NP_2	ill-formed
$*[M_1[M_2[N\ M_3]_{NP_3}]_{NP_2}]_{NP_1}$	(42g)	NP_1, NP_2	NP_3	ill-formed
$*[M_1[M_2[M_3\ N]_{NP_3}]_{NP_2}]_{NP_1}$	(42h)	NP_1, NP_2, NP_3	∅	ill-formed

The above table demonstrates that there is a significant relationahip between the well-formedness of sentences and the selection of the NP's to which the rule of N-M inversion can apply. The fact is that the acceptability of (42a, b, c, d) and the unacceptability of (42e, f, g, h) are related to the selection of the NP's to which the rule of N-M inversion can apply. A sentence is well-formed if one or no NP is affected by the rule. Otherwise a sentence is ill-formed. This clearly shows that the constraint on N-M inversion proposed earlier as in (41) not only holds for cases whose NP's containing two modifiers, but also holds for cases whose NP's containing three modifiers such as (42). The argument is that we can account for the well-formedness of sentences (42a-d) by constraining the rule of N-M inversion as in (41). For example, there is only one NP chosen to which the rule of N-M inversion applies in the forms $[[M_1[N\ M_3]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$ (e.g. 42a), $[[M_2[N\ M_3]_{NP_3}]_{NP_2}\ M_1]_{NP_1}$ (e.g. 42b), and $[[[M_3\ N]_{NP_3}\ M_2]_{NP_2}\ M_1]_{NP_1}$ (e.g. 42c). Thus they are well-formed. On the other hand, there are two NP's chosen to which the rule applies in the forms $*[[M_2[M_3\ N]_{NP_3}]_{NP_2}\ M_1]_{NP_1}$ (e.g. 42e),

*$[[M_1[M_3\ N]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$ (e.g. 42f) and *$[M_1[M_2[N\ M_3]_{NP_3}]_{NP_2}]_{NP_1}$ (e.g. 42g). Thus they are ill-formed. Similarly, there are three NP's chosen to which the rule applies in the form *$[M_1[M_2[M_3\ N]_{NP_3}]_{NP_2}]_{NP_1}$ (e.g. 42h). Thus it is ill-formed.

Comparing this analysis based on our N-M hypothesis with the one based on the M-N hypothesis, we can conclude again, that the former is more desirable because it provides a nice account of various surface patterns without positing complex constraints on the rule.

1.4. NP's Containing Four Modifiers

Another set of sentences that provide further support for the proposed N-M hypothesis is to be found in the following:

(48)a. Qiúanbù xiuéshēng dài màuz de dài yǐanjìng de gāu de láile.
all student wear hat re. wear glasses rel. tall rel. came
'All of the tall students who wear hats who wear glasses came.'

b. Gāude xiuéshēng dài màuz de dài yǐanjìng de qiúanbù láile.
tall student wear hat rel.wear glasses rel. all came

c. Dài yǐanjìng de xiuéshēng dai màuz de gāude qiúanbù láile.
wear glasses rel. students wear hat rel. tall all came

d. Dài màuz de xiuéshēng dài yǐanjìng de gāude qiúanbù láile.
wear hat rel. student wear glasses rel. tall all came

e. Xiuéshēng dài màuz de dài yǐanjìng de gāude qiúanbù láile.
student wear hat rel. wear glasses rel. tall all came

f. *Gāude dài yǐanjìng de dài màuz de xiuéshēng qiúanbù láile.
tall wear glasses rel. wear hat rel. student all came

g. *Qiúanbù dài yǐanjìng de dài màuz de xiuéshēng gāude láile.
all wear glasses rel. wear hat rel. student tall came

h. *Qiúanbù gāude dài màuz de xiuéshēng dài yǐanjìng de láile.
all tall wear hat rel. student wear glasses rel. came

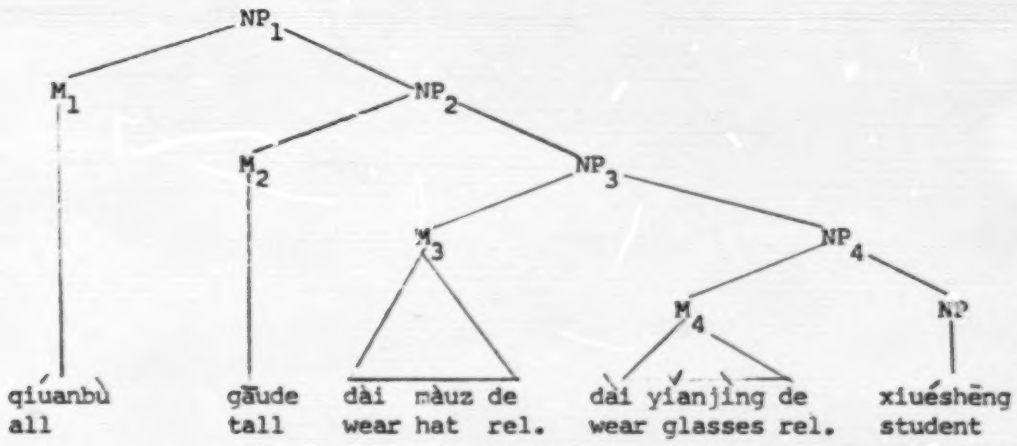
i. *Qiúanbù gāude dài yǐanjìng de xiuéshēng dài màuz de láile.
all tall wear glasses rel. student wear hat rel. came

j. *Qiúanbù gāude dài yǐanjìng de dài màuz de xiuéshēng láile.
all tall wear glasses rel. wear hat rel. student came.

1.4.1. M-N Hypothesis

Starting out with a M-N sequence the underlying structure for the NP in (48) will be something like the following:

(49)



Consider the table indicating the sentence patterns as exhibited by sentence (48) as in (50)

(50)a. $[[[[M_1[\ N\ M_4]_{NP_4}\ M_3]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$ (48a)

b. $[_[M_2[\ N\ M_4]_{NP_4}\ M_3]_{NP_3}\ ]_{NP_2}\ M_1]_{NP_1}$ (48b)

c. $[[[[M_3\ N]_{NP_3}\ M_4]_{NP_4}\ M_2]_{NP_2}\ M_1]_{NP_1}$ (48c)

d. $[[[[M_4\ N]_{NP_4}\ M_3]_{NP_3}\ M_2]_{NP_2}\ M_1]_{NP_1}$ (48d)

e. $[[[[N\ M_4]_{NP_4}\ M_3]_{NP_3}\ M_2]_{NP_2}\ M_1]_{NP_1}$ (48e)

f. $\cdot[[M_2[\ M_3[\ M_4\ N]_{NP_4}]_{NP_3}]_{NP_2}\ M_1]_{NP_1}$ (48f)

g. $\cdot[[M_1[\ M_3[\ M_4\ N]_{NP_4}]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$ (48g)

h. $\cdot[[M_1[\ M_2[\ M_4\ N]_{NP_4}\ M_3]_{NP_3}]_{NP_2}]_{NP_1}$ (48h)

i. $\cdot[\ M_1[\ M_2[\ M_3[\ N\ M_4]_{NP_4}]_{NP_3}]_{NP_2}]_{NP_1}$ (48i)

j. $\cdot[\ M_1[\ M_2[\ M_3[\ M_4\ N]_{NP_4}]_{NP_3}]_{NP_2}]_{NP_1}$ (48j)

and the table indicating the relationships between the well-formedness of sentence and the selection of NP's to which the rule of M-N inversion can apply as in (51).

(51)

surface forms	sentences	NP's are affected by M-N Inversion	NP's are not affected by M-N Inversion	well-formedness
$[[[M_1 [N\ M_4]_{NP_4}\ M_3]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$	(48a)	NP_2, NP_3, NP_4	NP_1	well-formed
$[[[M_2 [N\ M_4]_{NP_4}\ M_3]_{NP_3}\ M_1]_{NP_2}]_{NP_1}$	(48b)	NP_1, NP_3 NP_4	NP_2	well-formed
$[[[M_3\ N]_{NP_3}\ M_4]_{NP_4}\ M_2]_{NP_2}\ M_1]_{NP_2}$	(48c)	NP_1, NP_2, NP_4	NP_3	well-formed
$[[[[M_4\ N]_{NP_4}\ M_3]_{NP_3}\ M_2]_{NP_2}\ M_1]_{NP_1}$	(48d)	NP_1, NP_2, NP_3	NP_4	well-formed
$[[[[N\ M_4]_{NP_4}\ M_3]_{NP_3}\ M_2]_{NP_2}\ M_1]_{NP_1}$	(48e)	NP_1, NP_2, NP_3, NP_4	Ø	well-formed
$*[[M_2\ [M_3\ [M_4\ N]_{NP_4}]_{NP_3}]_{NP_4}\ M_1]_{NP_1}$	(48f)	NP_1	NP_2, NP_3, NP_4	ill-formed
$*[[M_1\ [M_3\ [M_4\ N]_{NP_4}]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$	(48g)	NP_2	NP_1, NP_3, NP_4	ill-formed
$*[[M_1\ [M_2\ [M_4\ N]_{NP_4}\ M_3]_{NP_3}]_{NP_2}]_{NP_1}$	(48h)	NP_3	NP_1, NP_2, NP_4	ill-formed
$*[M_1\ [M_2\ [M_3\ [N\ M_4]_{NP_4}]_{NP_3}]_{NP_2}]_{NP_1}$	(48i)	NP_4	NP_1, NP_2, NP_3	ill-formed
$*[M_1\ [M_2\ [M_3\ [M_4\ N]_{NP_4}]_{NP_3}]_{NP_2}]_{NP_1}$	(48j)	(generated by phrase structure rules in the base)	Ø	ill-formed

What the above table demonstrates are the following. First, in order to derive the form $[[[[N \ M_4]_{NP_4} \ M_3]_{NP_3} \ M_2]_{NP_2} \ M_1]_{NP_1}$ (e.g. 48e) from (49) but to block the form $*[M_1[M_2[M_3[M_4 \ N]_{NP_4}]_{NP_3}]_{NP_2}]_{NP_1}$ (e.g. 48j), it is necessary to constraint the rule of M-N inversion so that it must apply to every NP, moving M_1, M_2, M_3, M_4 to the postnominal positior Second, in order to derive the form $[[[M_1[N \ M_4]_{NP_4} \ M_3]_{NP_3} \ M_2]_{NP_2}]_{NP_1}$ (e.g. 48a), $M_2[N \ M_4]_{NP_4} \ M_3]_{NP_3}]_{NP_2} \ M_1]_{NP_1}$ (e.g. 48b), $[[[[M_3 \ N]_{NP_3} \ M_4]_{NP_4} \ M_2]_{NP_2} \ M_1]_{NP_1}$ (e.g. 48c), $[[[[M_4 \ N]_{NP_4} \ M_3]_{NP_3} \ M_2]_{NP_2} \ M_1]_{NP_1}$ (e.g. 48d), $[[[[N \ M_4]_{NP_4} \ M_3]_{NP_3} \ M_2]_{NP_2} \ M_1]_{NP_1}$ (e.g. 48e), but to block the forms $*[[M_2[M_3[M_4 \ N]_{NP_4}]_{NP_3}]_{NP_2} \ M_1]_{NP_1}$ (e.g. 48f), $[[M_1[M_3[M_4 \ N]_{NP_4}]_{NP_3} \ M_2]_{NP_2}]_{NP_1}$ (e.g. 48g), $[[M_1[M_2[M_4 \ N]_{NP_4} \ M_3]_{NP_3}]_{NP_2}]_{NP_1}$ (e.g. 48h), and $[M_1[M_2[M_3[N \ M_4]_{NP_4}]_{NP_3}]_{NP_2}]_{NP_1}$ (e.g. 48i), it is necessary to constrain the rule so that it must apply to every NP that satisfies its structural description, but leaving at least one NP unaffected by the rule.

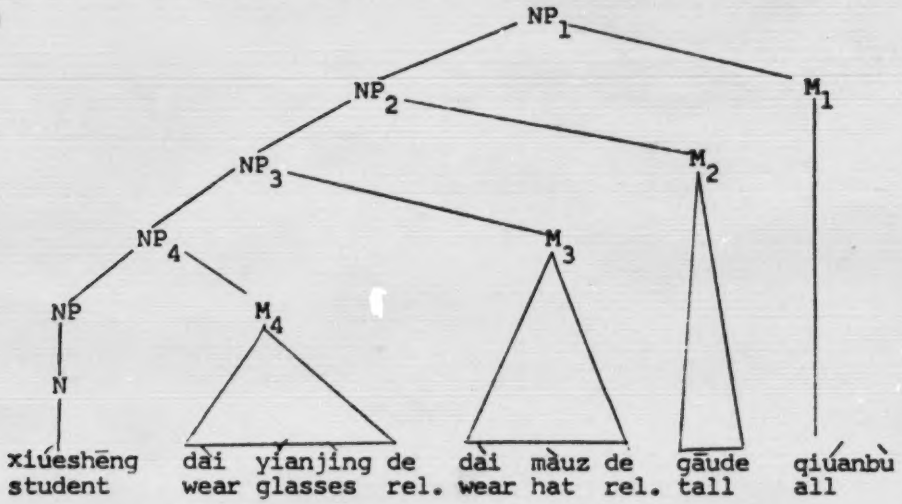
Again, what the above demonstrates is that sentences whose NP's containing four modifiers cannot be nicely accounted for under the M-N hypothesis unless certain highly complex constraints on the rule of M-N inversion are implemented into the grammar as in (36). Below I will show cases like (48), however, can be nicely accounted for under the N-M hypothesis.

1.4.2. N-M Hypothesis

Let us take a look at how the sentences containing four modifiers as in (48) can be accounted for within the N-M hypothesis. Starting out

with a N-M sequence, the modified NP in (48a) will have the following structure:

(52)



Again, it is relatively easy to show that the proposed constraint as in (41) also holds here. In order to show that (41) is capable of accounting for cases such as (48), it is necessary to demonstrate the relationship between the well-fromedness of sentences and the selection of NP's to which the rule of N-M inversion can apply. Consider the following table:

(53)

surface form	sentence	NP's are affected by N-M Inversion	NP's are not affected by N-M Inversion	well-formedness
$[[[M_1[\ N\ M_4]_{NP_4}\ M_3]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$	(48a)	NP_1	NP_2, NP_3, NP_4	well-formed
$[[[M_2[\ N\ M_4]_{NP_4}\ M_3]_{NP_3}]_{NP_2}\ M_1]_{NP_1}$	(48b)	NP_2	NP_1, NP_3, NP_4	well-formed
$[[[M_3\ N]_{NP_3}\ M_4]_{NP_4}\ M_2]_{NP_2}\ M_1]_{NP_1}$	(48c)	NP_3	NP_1, NP_2, NP_4	well-formed
$[[[M_4\ N]_{NP_4}\ M_3]_{NP_3}\ M_2]_{NP_2}\ M_1]_{NP_1}$	(48d)	NP_4	NP_1, NP_2, NP_3	well-formed

$[[[[_N\ M_4]_{NP_4}\ M_3]_{NP_3}\ M_2]_{NP_2}\ M_1]_{NP_1}$	(48e)	generated by the base rule	Ø	well-formed
$*[[M_2[\ M_3[\ M_4\ N]_{NP_4}]_{NP_3}]_{NP_2}\ M_1]_{NP_1}$	(48f)	NP_2, NP_3, NP_4	NP_1	ill-formed
$*[[M_1[\ M_3[\ M_4\ N]_{NP_4}]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$	(48g)	NP_1, NP_3, NP_4	NP_2	ill-formed
$*[[M_1[\ M_2[\ M_4\ N]_{NP_4}\ M_3]_{NP_3}]_{NP_2}]_{NP_1}$	(48h)	NP_1, NP_2, NP_4	NP_3	ill-formed
$*[\ M_1[\ M_2[\ M_3[\ N\ M_4]_{NP_4}]_{NP_3}]_{NP_2}]_{NP_1}$	(48i)	NP_1, NP_2, NP_3	NP_4	ill-formed
$*[\ M_1[\ M_2[\ M_3[\ M_4\ N]_{NP_4}]_{NP_3}]_{NP_2}]_{NP_1}$	(48j)	NP_1, NP_2, NP_3, NP_4	Ø	ill-formed

The above shows that there is a significant relationship between the well-formedness of sentences and the selection of the NP's to which the rule of N-M inversion can apply. The acceptability of (48a, b, c, d, e) and the unacceptability of (48f, g, h, i, j) clearly show that the well-formedness of sentences are related to the selection of the NP's to which the rule of N-M inversion can apply. A sentence is well-formed if either one or no NP chosen for the rule of N-M inversion to apply. Otherwise a sentence is ungrammatical. This clearly shows that the proposed constraint as in (41) not only holds for sentence whose NP's containing two and three modifiers, but also holds for sentences whose NP's containing four modifiers such as (48). The argument is that we can account for the well-formedness of (48) in the following way. For example, there is either one or no NP chosen to which the rule applies in the forms

$M_1[\ N\ M_4]_{NP_4}\ M_3]_{NP_3}\ M_2]_{NP_2}]_{NP_1}$ (e.g. 48a), $[[[M_2[\ N\ M_4]_{NP_4}$

$M_3]_{NP_3}]_{NP_2}\ M_1]_{NP_1}$ (e.g. 48b), $[[[M_3\ N]_{NP_3}\ M_4]_{NP_4}\ M_2]_{NP_2}\ M_1]_{NP_1}$

(e.g. 48c), $[[[[M_4 \quad N]_{NP_4} \quad M_3]_{NP_3} \quad M_2]_{NP_2} \quad M_1]_{NP_1}$ (e.g. 48d),

$[[[[N \quad M_4]_{NP_4} \quad M_3]_{NP_3} \quad M_2]_{NP_2} \quad M_1]_{NP_1}$ (e.g. 48e). Thus they are well-formed. On the contrary, there are more than one NP chosen to which the rule applies in the forms $\cdot[[M_2 \quad M_3[\quad M_4 \quad N]_{NP_4}]_{NP_3}]_{NP_2} \quad M_1]_{NP_1}$ (e.g. 48f)

$\cdot[[M_1 \quad M_3[\quad M_4 \quad N]_{NP_4}]_{NP_3} \quad M_2]_{NP_2}]_{NP_1}$ (e.g. 48g), $\cdot[[[M_1 \quad M_2[\quad M_4 \quad N]_{NP_4}$

$M_3]_{NP_3}]_{NP_2}]_{NP_1}$ (e.g. 48h), $\cdot[M_1[\quad M_2[\quad M_3[\quad N \quad M_4]_{NP_4}]_{NP_3}]_{NP_2}]_{NP_1}$

(e.g. 48i), $\cdot[M_1[\quad M_2[\quad M_3[\quad M_4 \quad N]_{NP_4}]_{NP_3}]_{NP_2}]_{NP_1}$ (e.g. 48j).

This section together with section 1.1., 1.2., and 1.3. has been an attempt to argue against a M-N sequence, but for a N-M sequence as the underlying order for a modified NP in Chinese. The argument has been twofold: on the one hand, it has been demonstrated that various surface patterns of NP's containing more than one modifier cannot be adequately accounted for within the M-N hypothesis, since it complicates the grammatical description by requiring a set of complex constraints on the rule of M-N inversion; on the other hand, it has been shown that such patterns can best be accounted for within the N-M hypothesis, since it simplifies the grammitical description by constraining the rule of N-M inversion in such a way that it can apply to any NP, either a higher one, or a lower one, but only once within the domain of a possible complex NP.

2. Preverbal Nominal Modifier

2.1. Preverbal Nominal Modifiers

In Chinese nominal modifiers can occur in preverbal position. Consider:

A. Quantifiers

(54)a. Xuéshēng qiúanbù láile. 'All of the students came.'
student all came

b. (Guānyú) xiuéshēng, qiúanbù láile.
As for student all came
'As for the students, all of them came.'

(55) a. Xiúeshēng méiyígè láile.
student each came
'Each of the students came.'

b. (Guānyú) xiuéshēng, méiyígè láile.
As for student each came
'As for the students, each of them came.'

(56) a. Xiuéshēng móxiē láile.
student some came
'Some of the students came.'

b. (Guānyú) xiuéshēng, móxiē láile.
As for student some came
'As for the students, some of them came.'

(57) a. Xiuéshēng hénduō láile.
student many came
'Many of the students came.'

b. (Guānyú) xiuéshēng, hénduō láile.
as for student many came
' As for the students, many of them came.'

(58) a. Xiuéshēng yìbǎige láile.
student 100 came
'One hundred of the students came.'

b. (Guānyú) xiuéshēng, yìbǎige láile.
as for student 100 came
'As for the students, one hundred of them came.'

B. Determiners

(59) a. Xiuéshēng zhèixiē láile.
student these came
'These students came.'

b. (Guānyú) xiuéshēng, zhèixie láile.
as for student these came
' As for the students, these came.'

C. Adjective

(60) a. Xiuéshēng tsūngmíngde láile.
student intelligent came
'The intelligent students came.'

b. (Guānyú) xiuéshēng, tsūngmíngde láile.
as for student intelligent came
'As for the students, the intelligent ones came.'

D. Measure Phrase

(61) a. Xiuéshēng èrshísuìdàde láile.
student 20-year-old came
'The twenty-year-old students came.'

b. (Guānyú) xiuesheng, èrshísuìdàde láile.
as for student 20-year-old came
'As for the students, the 20-year-old ones came.'

E. Relative Clause

(62) a. Xiuéshēng, dài yǐanjìng de láile.
student wear glasses rel. came
'The students who wear glasses came.'

b. (Guānyú) xuéshēng, dài yǐanjìng de láile. 'As for the students, the ones who wear glasses came.'
as for student wear glasses rel. came

2.2. Preverbal Nominal Modifiers and Topicalization

In Hou (1974a) I propose that in Chinese there is a topicalization transformation which moves NP's to the front of a sentence as schematized in (63).

(63) $\underset{1}{X}\ \underset{2}{NP}\ \underset{3}{Y} \Longrightarrow 2\ \#\ {}_{S}[\ 1\ \emptyset\ 3$

This transformation relates (a), (b) and (c) in the following sentences:

(64)a. Xuéshēng láile. 'The students came.'
student came

b. (Guānyú) xuéshēng, láile. 'As for the students, they came.'
as for student came

(65)a. Xuéshēng mǎile shū. 'The students bought the books.'
student bought book

b. (Guānyú) xuéshēng, mǎile shū. 'As for the students, they bought the books.'
as for student bought book

c. (Guānyú) shū, xuéshēng mǎile. 'As for the books, the students bought.'
as for book student bought

We can account for (54b)-(62b) by reformulating the proposed rule of topicalization so that it can either move the whole noun phrase to the front of a sentence or move only the noun, leaving the modifier behind. The reformulation of topicalization can be schematized as in (66).

(66) Topicalization:

SD: $\underset{1}{X}\ \underset{2}{N}\ \underset{3}{M}\ \neg_{NP}\ \underset{4}{Y} \Longrightarrow$

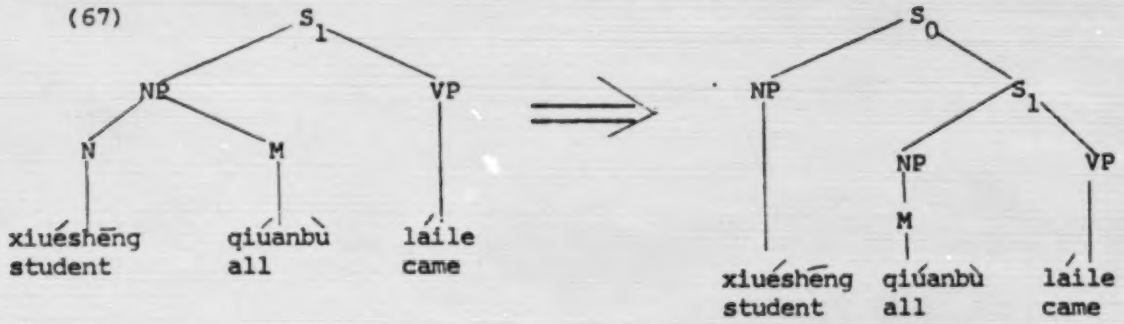
SC: (a) $2 + 3\ \#\ {}_{S}[\ 1\ \emptyset\ \emptyset\ 4$

(b) $2\ \#\ {}_{S}[\ 1\ \emptyset\ 3\ 4$

M = Quantifiers, Determiners, Adjectives, Measure Phrase, Relative Clause, etc.

Thus, we can derive (5 b) in the following fashion:

(67)



However, this analysis is inadequate because there are topicalized sentences in Chinese whose structure cannot be derived from the application of movement transformation. For example, the following topicalized sentences have no non-topicalized counterparts.

(68) Huā méiguèi zuèi hǎukàn. 'As for flowers, roses are most
flower rose most beautiful beautiful.'

(69) Jiàoyù Max bù tóngyì Russell. 'As for education, Max does agree
education not agree with Russell.

(70) Yǔyánxué yǔfǎ zuèi liúxíng. 'As for linguistics, syntax is
linguistics syntax most popular most popular.'

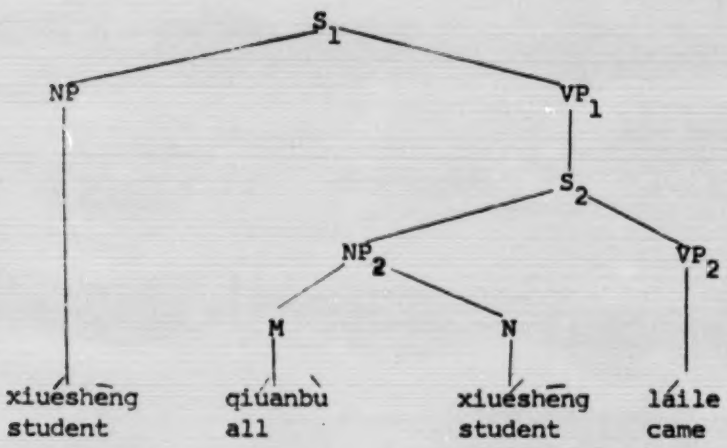
(71) Hǎi Tàipíngyáng zuèi dà. 'As for ocean, the Pacific is the
ocean Pacific Ocean most large largest.'

(72) Jūngguó tsài Max xǐhwān kǎoyā. 'As for Chinese food, Max
Chinese food like roast duck likes roast duck.'

2.3. Teng's Analysis

Teng (1974) suggests that sentences such as (54b)-(62b) are double nominative constructions and are to be generated directly by phrase structure rules in the base. That is, the noun in the initial position and the noun and nominal modifier in preverbal position are both nominatives in the underlying structure. In other words, both are interpreted as topics. For example, (54b) will have the following underlying structure in Teng's framework:

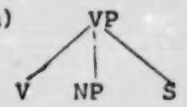
(73)



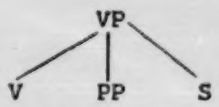
In order to derive (54b) from a structure like (73) Teng claims that the only transformation needed is a rule deleting the repeated element--xiuéshēng 'student' in NP_2 of S_2 yielding the correct surface form.

There are two factors that argue against Teng's proposal. The first concerns the validity of the structure (73). In general an S can be dominated by a VP as a complement as shown in (74).

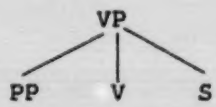
(74) (a)



(b)



(c)



(a), (b), and (c) are very common and can be found in many languages. For example, (a) and (b) are found in English, whereas (a), (b), and (c) are found in Chinese. However, in (73) we find that an S is immediately dominated by a VP. What Teng suggests is that in the base there is a rule which says a VP can be expanded as an S. Such a proposal is unjustified because there are no evidence which indicate such a relation does exist in natural language. Another factor against Teng's proposal concerns the placement of the negative adverb bù 'not'. There is a general rule in Chinese which states that negative adverb bù 'not' occurs before the verb except in the case of double nominative construction, where bù 'not' can occur either before a verb or before a noun which is followed by a verb. For example, bù 'not' is placed before the verb in a non-double nominative sentence such as (75).

(75) a. Max xǐhuān Měigwó fàn. 'Max likes American food.'
like American food

b. Max bù xǐhuān Měigwó fàn. 'Max does not like American food.'
not like American food

However, bù 'not' is placed either before the verb or before the noun in a double nominative sentence such as (76).[2]

(76) a. Max tóu téngle. 'Max has a headache.'
head painful

b. Max tóu bù téngle. 'Max does not have a headache.'
head not painful

c. Max bù tóu téngle. 'Max does not have a head-
not head painful ache.'

As an illustration, consider sentences (54b) and (62b). If these sentences were double nominatives, then their negative counterparts should be the following:

(77) a. Xuéshēng qiúanbù bù láile. 'All of the students didn't
student all not came come.'

b. Xuesheng bù qiúanbù láile. 'Not all of the students
student not all came came.'

(78) a. Xuésheng dài yǐanjìng de bù láile. 'The students who wear
student wear glasses rel. not came glasses didn't come.'

b. Xuésheng bù dái yǐanjìng de láile. 'Students who didn't
student not wear glasses rel. came wear glasses c me.'

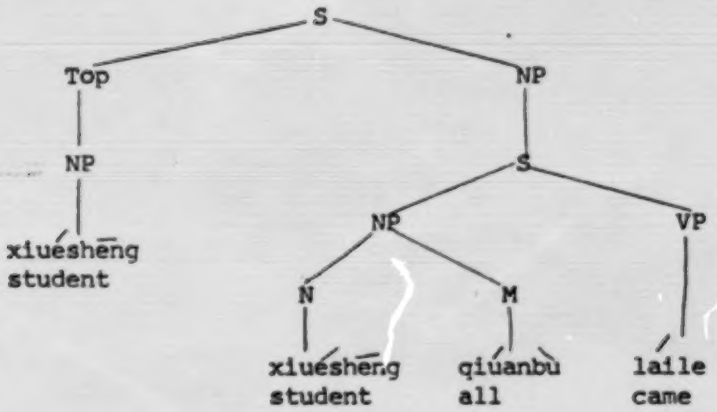
Since the negative counterparts of (54b) and (62b) are (77a) and (78a), but not (77b) and (78b) respectively and since (77a) and (78a) and (77b) and (78b) are not synonymous with each other, we must conclude the following: sentences such as (54)-(62) are not double nominative constructions and they should be derived from different logical structure.

2.4. The Underlying Structure of Topicalized Sentences: A Proposal

Based on the fact that all types of topicalized sentences such as (54b)-(62b) and cases like (63)-(72) should be derived from the same kind of

logical structure, I propose that sentences like (54b) has the following underlying structure:[3]

(79)



To derive (54b) from (79), the only transformation we need is a rule that deletes the repeated element--xiuéshēng 'student'. There are three factors arguing for this analysis. First, it provides a nice common source for all types of the topicalized sentences by generating them directly in the base by phrase structure rules. Second, it captures the semantic relation between the notions such as topic and comment in a explicit manner. Third, it provides an explanation for the relationship between a modified noun and its modifier. That is, the close relationship between modifiers and nouns with which they are associated is nicely explicated by treating them as clause mates in the same constituent in the underlying structure.

3. Postverbal Nominal Modifiers

3.1. Postverbal Modifiers

Nominal modifiers in Chinese can also occur in postverbal position. This is exemplified in (80)-(88).

A. Quantifier

(80)a. Xiuéshēng qiúanbù láile. 'All of the students came.'
student all came

b. Xiuéshēng (lǐtou), láile qiúanbù. 'As for the students, all of them came.'
student among came all

(81)a. Xuéshēng měiyígè láile.
student each came
'Each of the students came.'

b. Xuéshēng (lǐtou), láile měiyígè.
student among came each
'As for the students, each of them came.'

(82)a. Xuéshēng mǒxiē láile.
student some came
'Some of the students came.'

b. Xuéshēng (lǐtou), láile mǒxiē.
student among came some
'As for the students, some of them came.'

(83)a. Xuéshēng hěnduō láile.
student many came
'Many of the students came.'

b. Xuéshēng (lǐtou), láile hěnduō.
student among came many
'As for the students, many of them came.'

(84)a. Xuéshēng yibaige láile.
student 100 came
'One hundred of the students came.'

b. Xuéshēng (lǐtou), láile yìbǎigè.
student among came 100
'As for the students, one hundred of them came.'

B. Determiners

(85)a. Xuéshēng nèixiē láile.
student those came
'Those students came.'

b. Xuéshēng (litou), láile nèixiē.
student among came those
'As for the students, these came.'

C. Adjectives

(86)a. Xuéshēng tsungmíngde láile.
student intelligent came
'The intelligent students came.'

b. Xuéshēng (lítou), láile tsūngmíngde.
student among came intelligent
'As for the students, the intelligent ones came.'

D. Measure Phrases

(87)a. Xuéshēng èrshísuìdàde láile.
student 20-year-old came
'The 20-year-old students came.'

b. Xuéshēng (lǐtou), laile èrshísuìdàde.
student among came 20-year-old
'As for the students, the 20-year-old ones came.'

E. Relative Clauses

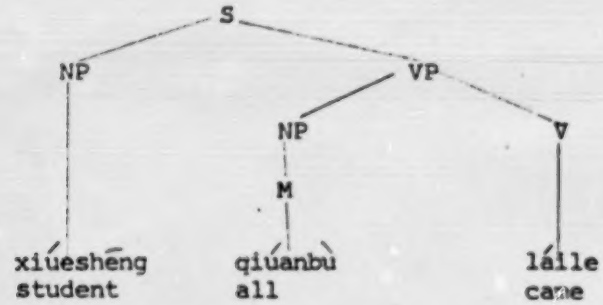
(88)a. Xuéshēng dài yǐanjìng de láile.
student wear glasses rel. came
'The students who wear glasses came.'

b. Xuéshēng (litou), láile dài yǐanjìng de.
student among came wear glasses rel.
'As for the students, the one who wear glasses came.'

3.2. Tai's Analysis

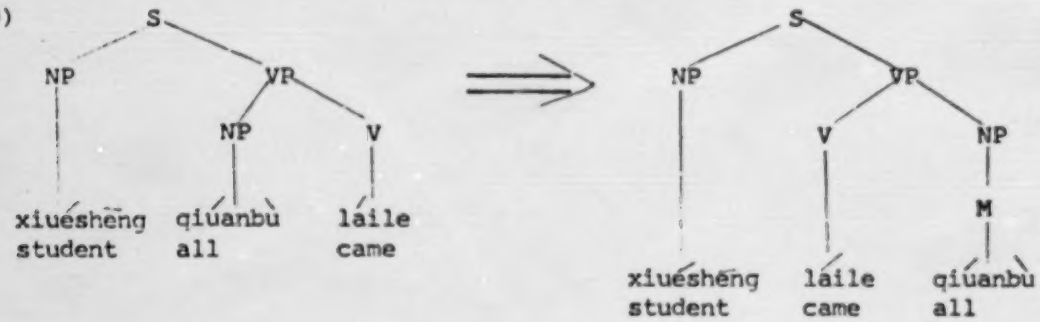
In Tai (1973) it is proposed that sentences like (80b)-(88b) can be related to (80a)-(88a) by what he called NP-V inversion transformation. He proposes that sentence (80b) has the following structure:

(89)



Then (80b) can be derived from (89) by undergoing the NP-V inversion transformation which is schematized as in the following derivation:

(90)

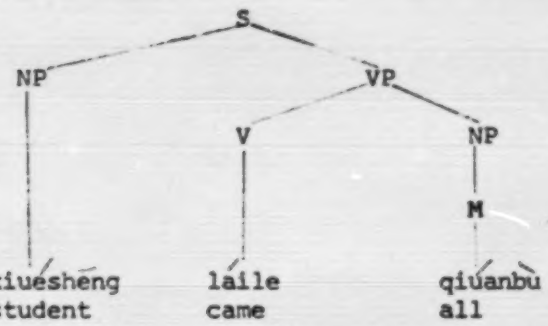


Tai's analysis is unjustified, because, as I have argued earlier, it treats nominal modifiers as part of the VP although they are closely related to the nouns they modify. The result of this is that the modifiers are associated with the VP in the underlying structure, causing problems in explaining the semantic relation between the NP in subject position and the modifier in VP.

3.3. Li and Thompson's Analysis

Li and Thompson (1974) suggests that sentences such as (80b) is derived directly by phrase structure rule in the base component with a structure as shown in (91):

(91)



The problem in this analysis, again, is that it would complicate the grammar if the nominal modifiers were to be analyzed as part of the VP constituent in the underlying structure. Below is one argument against such an analysis.

In general the negative adverb bù 'not' is placed before a verb which is followed by a noun. For example:

(92)a. Max xǐhwān píngguǒ. 'Max likes apple.'
like apple

b. Max bù xǐhwān píngguǒ. 'Max does not like apple.'
not like apple

Consider sentences (80b)-(88b). If nominal modifiers in these sentences were to be analyzed as part of the VP constituent, then their negative counterparts should be exactly the same as (92). However, the situation in these sentences is different. For example, the negative counterparts of sentences (80b) and (88b) are not (93a) and (94a), but rather (93b) and (94b) respectively.

(93)a. *Xuéshēng bù láile qiúanbù. 'All of the students did not
student not came all come.'

b. Xuéshēng bù qiúanbù láile.
student not all came

(94)a. *Xuéshēng bu laile dai yǐanjìng de. 'The students who did not
student not came wear glasses rel. wear glasses came.'

b. Xuéshēng bú dài yǐanjìng de láile.
student not wear glasses rel. came

On the one hand, the acceptability of (93b) and (94b) clearly indicates that the nominal modifiers in these sentences are closely related to nouns with

which they are associated. On the other hand, the unacceptability of (93a) and (94a) indicates that nominal modifiers in these sentences cannot be analyzed as part of the VP constituent. The argument is that, if the modifiers in these sentences were to be analyzed in the VP constituent in underlying structure, then the complication involved with the placement of the adverb bù 'not' will result, namely the modifier must be preposed next to the noun with which they are associated before the bù is placed before the verb in order to derive (93b)-(94b). To accomplish that a rule that moves the modifiers to a preverbal position is eventually needed just in case bù occurs before the verb. Li and Thompson's treatment is not desirable because it would complicate the grammar by introducing new rules.

3.4. Modifier Postposing Transformation

Another way to account for (80b)-(88b) is by assuming that there is a modifier postposing rule in Chinese that moves modifiers out of the NP's with which they are associated to a postverbal position. For example, sentence (80b) will have the following derivation:

(95)

The problem in this analysis concerns the placement of the modifiers. Consider the rule of modifier postposing which moves modifiers to a post verbal position. If such a rule is built into the grammar of Chinese and if we allow it to apply freely, then the difficulty confronting us is that there is no way to prevent nominal modifiers, and quantifiers in particular, from moving to an improper position, thereby conveying different semantic interpretations.

Consider the following sentences:

(96)a. Xuéshēng qiúanbù mǎile shū. 'All of the students
student all bought book bought books.'

b. Xuéshēng, mǎile qiúanbù shū. 'The students bought all
student bought all book of the books.'

Sentence (96b) is a perfectly good Chinese sentence and it could be derived by the application of the rule of modifier postposing. That is, if we allow modifier postposing to apply freely, then this rule could convert (96a) into (96b). The fact is that (96a) is not synonymous with (96b) as we can see in the English translation. They differ in meaning because in (96a) modifier modifies the subject, and in (96b) modifier modifies the object. For example, (96a) has the reading: All of the students bought the books; while (96b) has the reading: The students bought all of the books. Another set of sentences which could be generated by the modifier postposing transformation are found in the following:

(97)a. Ǎi háiz hē tāng. 'The short boy eats the soup.'
short boy drink soup

b. *Haiz hē ǎi tāng.
boy drink short soup

There are two alternatives that can be used as a blocking device to constrain the proposed modifier postposing transformation so that only well-formed sentences can be generated. On the one hand, we can prevent cases like (96b) and (97b) from being generated by constraining the modifier postposing rule in the following fashion:

(98) $\underset{1}{N}\ \underset{2}{M}\ ]_{NP}\ \underset{3}{X}\ \underset{4}{V}\ \underset{5}{Y} \Longrightarrow 1\ \emptyset\ 3\ 4\ 2\ 5$

Condition: $Y \neq NP$

The solution above is not a desirable one because it would rule out perfectly acceptable sentences such as (96b). The other posibility is that we can account for cases such as (96b) and (97b) by positing a perceptual constraint as in (99):

(99) Associate a nominal modifier with the nearest possible NP.

What (99) claims is that there is a general tendency that in Chinese a nominal modifier tends to modify the nearest possible NP. The function of this constraint is to provide an account for the improper placement of nominal modifier in cases like (96b) and semantic anomaly in cases like (97b). Now let us take a closer look at how cases such as (96b) and (97b) can be accounted for by the proposed constraint as in (99). One way to explain why (96b) should not be derived from (96a) through a rule of modifier posposing as in (98) is to say that if it so derived it would convey a different semantic interpretation according to (99). This means that (96b) must be interpreted as: The students bought all of the books but not All of the students bought the books according to (99). What this demonstrates is that (96b) cannot be derived from (96a) through a rule of modifier postposing. Rather, it would be derived from different structure. Similarly we can explain the semantic anomaly of (97b) by saying if it is so derived it would violate the constraint as in (99). The fact that (97b) is semantic anomalous is because there is no semantic compatibility between the nominal modifier ǎi 'short' and the noun tāng 'soup'. Therefore, ǎi 'short' cannot be interpreted as the modifier modifying tāng 'soup' although the tāng 'soup' is the nearest NP. This alternative is more desirable over the first one because the proposed perceptual constraint as in (99) provides a nice functional explanation for sentences such as (96b) and (97b).

4. Discontinuous Nominal Modifiers

Consider the following sentences:

(100) [Sānbǎige xuéshēng (lǐtou)]$_{NP}$ [láile [wushige.]$_{NP}$
300 student among came 50
'Out of the three hundred students, fofty came.'

(101) [Nèixiē xuéshēng (lǐtou)]$_{NP}$ láile [dài yǎnjìng de.]$_{NP}$
those student among came wear glasses rel.
'Out of those students, the ones who wear glasses came.'

(102) [Měiguó wǔshí zhōu (lǐtou)]$_{NP}$ Max dàoguo [bā zhōu.]$_{NP}$
U.S. 50 state among have been 8 state
'Out of the fifty states of U.S., Max has been to eight of them.'

(103) [Shíqīge xuésheng (lǐtou)]$_{NP}$ Max rènshī [liǎngge.]$_{NP}$
17 student among know 2
'Out of the seventeen students, Max knows two of them.'

One property that characterizes the above sentences is that in these sentences the two nominal expressions separated by the verb denotes a set versus subset relation. The first bracketed NP denotes a total set that is greater than that of the second bracketed NP. Another property exhibited by these sentences is that the NP denoting the universe set or the whole cannot be interchanged with the NP denoting the subset or the part. That is, interchanging the two bracketed NPs would make the sentences unacceptable. For example, the following sentences are unacceptable:

(104) * Wǔshígè xuésheng (lǐtou) láile sānbǎigè.
50 student among came 300

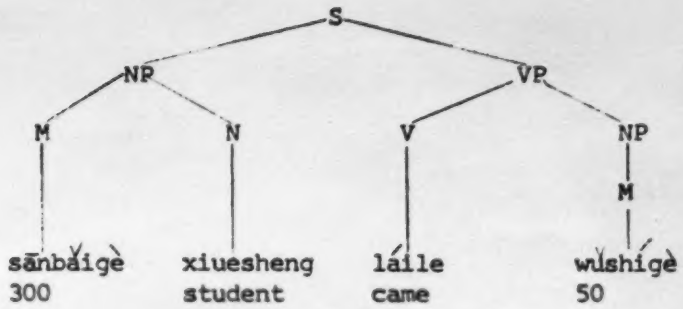
(105) * Bā zhōu (lǐtou) Max dàoguò Méiguó wǔshí zhōu.
8 state among have been U.S. 50 state.

(106) * Liǎngge xuéshēng (lǐtou) Max rènshī shíqīgè.
2 student among know 17

4.1. Li and Thompson's Analysis

Li and Thompson (1974) proposes that sentences such as (100) has an underlying structure as shown in (107):

(107)



What (107) claims is that sentences whose NP containing discontinuous modifiers such as (100)-(103) are directly derived by phrase structure rules in the base component.

One major problem in this analysis is that it fails to provide an account for the systematic relationship among transformationally related sentences. That is, this analysis provides no explanation for how sentences (103)-(106) can be related to their synonymous counterparts as shown below:

(108) Sānbǎigè xuéshēng (lǐtou), wǔshígè láile. 'Out of the three
300 student among 50 came students, fifty came.'

(109) Nèixiē xuéshēng (lǐtou) dài yǎnjìng de láile.
those student among wear glasses rel. came
'Out of those students, the ones who wear glasses came.'

(110) Max dàoguò Měiguó wǔshí zhōu (lǐtou) bā zhōu.
have been U.S. 50 state among 8 state
'Out of the fifty states of the U.S., Max has been eight of them.'

(111) Max rènshi shíqīgè xuéshēng (lǐtou) liǎnggè.
know 17 student among two
'Out of the seventeen students Max knows two of them.'

Here, sentences (100)-(103) are synonymous with (108)-(111) respectively and these sentences should be derived from a common source. This analysis is inadequate because it fails to explicate such relationship among these systematic related sentences. Another factor arguing against this analysis is that there is a strong evidence showing that the second modifier must be associated with the first modifier, but not with the VP in the underlying structure.

Consider the following sentences:

(112)a. *Nèixiē xuéshēng (lǐtou) bù láile dài yǐanjìng de.
those student among not came wear glasses rel.
'Those students who wear glasses did not come.'

b. Nèixiē xuéshēng (lǐtou) dài yǐanjìng de bù láile.
those student among wear glasses rel. not came

(113)a. *Shíqīgè xuéshēng (lǐtou) Max bù rènshi liǎnggè.
17 student among not know two
'Out of the seventeen students Max does not know two.'

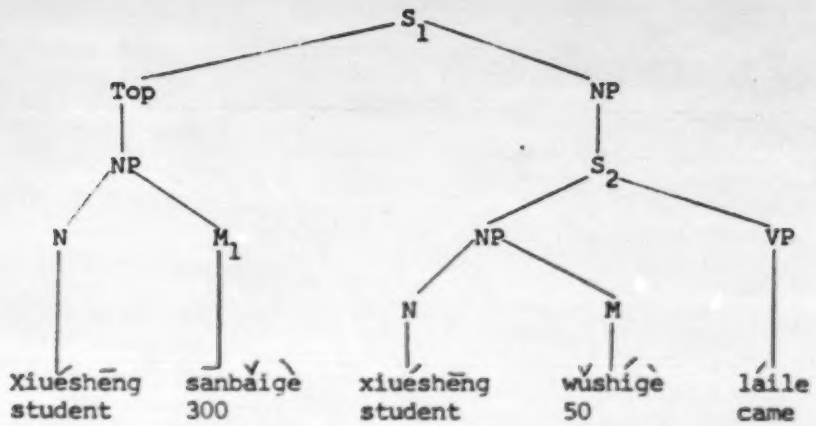
b. Shíqīgè xuéshēng (lǐtou) liǎnggè Max bù rènshī.
17 student among two not know

Note that the negative counterparts of (101) and (103) are 11 b) and (113b) respectively, but not (112a) and (113a). This means that the second modifiers in these sentences are closely related to the first modifier of the first bracketed NP, but not to the VP constituent. This demonstrates that the second nominal modifiers in sentences such as (100)-(103) should not be analyzed as part of the VP in underlying structure. The argument is that, if the second modifiers in these sentences were to be introduced as part of the VP, then the complication involved with the placement of adverbs such as bù 'not' For example, in order to derive (112b)-(113b), but to block (112a)-(113a), the second modifiers must be preposed next to the nouns with which they are associated before the adverbs are placed before the verb, thereby complicating the grammar.

4.3. Discontinuous Modifiers and Topicalization

Based on the fact that sentences whose NPs containing discontinuous nominal modifiers are closely related to the nouns, the fact that sentences (100)-(103) are transformationally related to sentences such as (108)-(111), and the fact that (100)-(103) are topicalized sentences, I propose that sentences like (100) has the following underlying structure:

(114)



To derive (100) from (114), two transformations are needed. First, a rule deletes the repeated element - xiuéshēng 'student' in S_2. Second, the modifier postposing moves the M of S_2 to a postverbal position yielding the correct surface form of (100)

There are two factors arguing for this analysis. First, it provides an explicit account of the semantic relationship between the topic and comment as exhibited by sentences such as (100)-(103). Second, it provides a nice common source for all the transformationally related sentences. For example, we can derive (108) from (114) simply by applying the rule that deletes the repeated element to NP of S_2, namely the rule deletes xiuésheng of S_2 yielding the correct surface form of (108).

5. Conclusion

This paper has been an attempt to argue against a M-N sequence, but for a N-M sequence as the underlying order for a modified NP in Chinese. The argument has been twofold: on the one hand, it has been demonstrated that various surface patterns of NP's containing more than one modifier cannot be adequately accounted for within the M-N hypothesis, since it complicates the grammatical description by requiring a set of complex constraints on the rule of M-N inversion; on the other hand, it has been shown that such patterns can best be accounted for within the N-M hypothesis, since it simplifies the grammatical

description by constraining the rule of N-M inversion in such a way that it can apply to any NP, either a higher one, or a lower one, but only once within the domain of a possible complex NP.

It has also been demonstrated in this study that nominal modifiers in preverbal or postverbal position are not part of the VP constituent, but rather as part of the NP with which they are associated. It has been first shown that such modifiers cannot be adequately accounted for by way of phrase structure rules, since there is no significant syntactic and semantic evidence in support of such a hypothesis. It has also been shown in this section that such modifiers cannot be adequately accounted for by the application of the proposed modifier postposing transformation alone. Rather, a perceptual constraint in Chinese which states that associate a modifier to the nearest possible NP must be implemented into the grammar so that semantic anomaly and the improper placement of nominal modifiers can be nicely explained.

FOOTNOTES

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[1]The term 'complex NP' here is defined as it refers to cases where a noun is modified by more than one nominal modifiers (e.g. quantifiers, determiners, adjectives, measure phrase, relative clause, etc.)

[2]Notice that one property characterizes the Chinese double nominative construction is that the second nominative is always referring to inalienable possessions or body parts. Some examples:

(1) a. Max yá téngle. 'Max has a toothache.'
tooth painful

b. Max yá bù téngle. 'Max does not have a toothache.'
tooth not painful

c. Max bù yá téngle.
not tooth painful

(2) a. Max jiǎo sūanle. 'Max's feet become sore.'
foot sore

b. Max jiǎo bù sūanle. 'Max's feet do not become sore.'
foot not sore

c. Max bù jiǎo suanle.
not foot sore

(3) a. Max tuǐ málе. 'Max's legs become numb.'
leg numb

b. Max tuǐ bù málе. 'Max's legs do not become numb.'
leg not numb

c. Max bu tuǐ málе.

The sentences above seem to constitute further evidence against analyzing sentences such as (54 -(62 as double nominatives.

[3]The structure (79) is interpreted as the underlying structure for all the topicalized sentences in Chinese. That is, in the base component, we have the following expensions:

(1) S ⟶ { NP + VP ; Top + NP }

(2) NP ⟶ { N + (N) ; S }

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